

We claim:

1. A material useful as catalyst, comprising

(a) iron or a compound based on iron or mix-  
tures thereof,

(b) from 0.001 to 0.3% by weight based on (a)  
of a promoter based on 2, 3, 4 or 5 elements selected  
from the group consisting of aluminum, silicon, zir-  
conium, titanium and vanadium,

(c) from 0 to 0.3% by weight based on (a) of a  
compound based on an alkali and/or alkaline earth  
metal, and also

(d) from 0.001 to 1% by weight based on (a) of  
manganese.

2. A material as claimed in claim 1, characterized by a BET  
surface area of from 3 to 20 m<sup>2</sup>/g, a total pore volume of  
from 0.05 to 0.2 mL/g, an average pore diameter of from  
0.03 to 0.1  $\mu$ m and a 0.01 to 0.1  $\mu$ m pore volume fraction  
within the range from 50 to 70%.

3. A material as claimed in claim 1 or 2, obtainable by  
reduction with or without subsequent passivation of a  
magnetite.

4. A material as claimed in any of claims 1 to 3, wherefor a  
promoter (b) based on aluminum, silicon and titanium is

used.

5. A material as claimed in any of claims 1 to 4, wherefor a promoter (c) based on magnesium and/or calcium is used.

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6. A process for hydrogenation of alpha, omega-dinitriles in the presence of a catalyst, which comprises using a material as claimed in any of claims 1 to 5 as catalyst.

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7. A process as claimed in claim 6, wherein the hydrogenation is effected in a fixed bed reactor.

8. A process as claimed in claim 6 or 7, wherein the catalyst is an unsupported catalyst.

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9. A process as claimed in any of claims 6 to 8, wherein the alpha, omega-dinitrile is hydrogenated to an alpha, omega-diamine.

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10. A process as claimed in claim 9, wherein the alpha, omega-dinitrile used is adiponitrile to obtain hexamethylenediamine.

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11. A process as claimed in any of claims 6 to 8, wherein the alpha, omega-dinitrile is hydrogenated to an alpha, omega-aminonitrile.

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12. A process as claimed in claim 11, wherein the alpha, omega-dinitrile used is adiponitrile to obtain 6-aminocapronitrile.

13. A process as claimed in any of claims 6 to 12,

wherein the alpha, omega-dinitrile used was obtained by hydrocyanation in the presence of phosphorus catalysts of an alpha, omega-diene having two carbon atoms fewer.

5           14.           A process as claimed in claim 13, wherein the weight fraction of phosphorus compound in the alpha, omega-dinitrile is reduced.

10           15.           A process as claimed in claim 13, wherein the weight fraction of phosphorus compound, reckoned as phosphorus, is less than 5 ppm, based on alpha, omega-dinitrile, after reduction in the level of phosphorus compounds.

15           16.           A process as claimed in claim 13, wherein the weight fraction of phosphorus compound, reckoned as phosphorus, is less than 1 ppm, based on alpha, omega-dinitrile, after reduction in the level of phosphorus compounds.

20           17.           The use of materials as claimed in any of claims 1 to 5 as catalysts in the hydrogenation of alpha, omega-dinitriles.